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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,287	06/27/2003	Yee-Chia Yeo	TSM03-0421	8528

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EXAMINER

CHAUDHARI, CHANDRA P

ART UNIT PAPER NUMBER

2891

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,287

Applicant(s)

YEO ET AL.

Examiner

Chandra Chaudhari

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-69 is/are pending in the application.
- 4a) Of the above claim(s) 27-43 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-26 and 44-52 is/are allowed.
- 6) ☒ Claim(s) 53-56, 58 and 60-69 is/are rejected.
- 7) ☒ Claim(s) 57 and 59 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on October 2, 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date Oct 2, 2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-26, 44-69, drawn to a method of making a semiconductor device, classified in class 438, subclass 157.
- II. Claims 27-43, drawn to a semiconductor device, classified in class 257, subclass 66.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by another and materially different process such as using mechanical means instead of etching.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Ira Matsil on February 15, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-26, 44-69. Affirmation of this election must be made by applicant in replying to this Office action. Claims 27-43 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The disclosure is objected to because of the following informalities:

Figs. 9a and 9b need to be added to the "Brief Description of the Drawings" (see MPEP 608.01(f)).

Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 53, 55, 58, 60-62, 67 are rejected under 35 U.S.C. 102(e) as being anticipated by Ahmed – US 6,686,231.

Ahmed (Figs. 2A-6B and text in col. 4, line 12 to col. 5, line 53) discloses the claimed invention by forming a multiple gate transistor device with semiconductor fin 130, gate dielectric 310, gate electrode 320 and planarizing to form a substantially planar upper surface, patterning and etching to form a gate electrode.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 54, 56, 63-66, 68-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmed.

Ahmed is applied as above and does not disclose specifics of the planarizing nor the gate dielectric material.

Ahmed does teach at col. 4, lines 50-53 that CMP or other techniques may be used for planarizing the gate material. It is reasonable to one of ordinary skill in the art to use the various materials claimed as the planarizing material depending on the removal rate necessary. Using a gate dielectric less than about 10 angstroms or of silicon oxynitride or of high permittivity greater than about 5 is reasonable to use depending on the electrical characteristics desired for proper device performance.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the claimed planarizing and gate dielectric materials in Ahmed's process as discussed above.

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Claims 1-26, 44-52 are allowed because the prior art does not disclose to form a gate dielectric over at least a portion of the semiconductor fin, forming a patterned mask over the second gate electrode material or planarizing the gate electrode material in conjunction with the other claim limitations.

Claims 57, 59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nowak - US 6,610,576 describes a double gated transistor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chandra Chaudhari whose telephone number is 571-272-1688. The examiner can normally be reached on Mon - Fri (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chandra Chaudhari
Primary Examiner
Art Unit 2829

C. Chaudhari
Chandra Chaudhari
March 18, 2005